Please provide the following information, and submit to the NOAA DM Plan Repository.

Reference to Master DM Plan (if applicable)

As stated in Section IV, Requirement 1.3, DM Plans may be hierarchical. If this DM Plan inherits provisions from a higher-level DM Plan already submitted to the Repository, then this more-specific Plan only needs to provide information that differs from what was provided in the Master DM Plan.

URL of higher-level DM Plan (if any) as submitted to DM Plan Repository:

1. General Description of Data to be Managed

1.1. Name of the Data, data collection Project, or data-producing Program:
Massachusetts and Rhode Island 2016 INVERT (Invertebrate Polygons)

1.2. Summary description of the data:
This data set contains sensitive biological resource invertebrate data in Massachusetts and Rhode Island. Vector polygons in this data set represent concentration and general distribution areas for bivalves, rare/threatened insects, lobster, crabs, gastropods, cephalopods and shrimp. Species-specific abundance, seasonality, status, life history, and source information are stored in associated data tables (described below) designed to be used in conjunction with this spatial data layer. This data set is a portion of the ESI data for Massachusetts and Rhode Island. As a whole, the ESI data characterize the marine and coastal environments and wildlife by their sensitivity to spilled oil, and include information for three main components: shoreline habitats, sensitive biological resources, and human-use resources. See also the INVERT_PT (Invertebrate Points) data layer for additional invertebrate information.

1.3. Is this a one-time data collection, or an ongoing series of measurements?
One-time data collection

1.4. Actual or planned temporal coverage of the data:
2014 to 2016

1.5. Actual or planned geographic coverage of the data:
W: -71.8944, E: -69.6609, N: 42.8876, S: 40.9459

1.6. Type(s) of data:
(e.g., digital numeric data, imagery, photographs, video, audio, database, tabular data, etc.)
Map (digital)

1.7. Data collection method(s):
(e.g., satellite, airplane, unmanned aerial system, radar, weather station, moored buoy, research vessel, autonomous underwater vehicle, animal tagging, manual surveys, enforcement activities, numerical model, etc.)

1.8. If data are from a NOAA Observing System of Record, indicate name of system:

1.8.1. If data are from another observing system, please specify:

2. Point of Contact for this Data Management Plan (author or maintainer)

2.1. Name:
ESI Program Manager

2.2. Title:
Metadata Contact

2.3. Affiliation or facility:

2.4. E-mail address:
orr.esi@noaa.gov

2.5. Phone number:

3. Responsible Party for Data Management
Program Managers, or their designee, shall be responsible for assuring the proper management of the data produced by their Program. Please indicate the responsible party below.

3.1. Name:
ESI Program Manager

3.2. Title:
Data Steward

4. Resources
Programs must identify resources within their own budget for managing the data they produce.

4.1. Have resources for management of these data been identified?

4.2. Approximate percentage of the budget for these data devoted to data management (specify percentage or "unknown"):

5. Data Lineage and Quality
NOAA has issued Information Quality Guidelines for ensuring and maximizing the quality, objectivity, utility, and integrity of information which it disseminates.

5.1. Processing workflow of the data from collection or acquisition to making it publicly accessible
(describe or provide URL of description):

Process Steps:

- 2016-01-01 00:00:00 - Step 1. Selecting species and data sources. Invertebrates depicted in this atlas include selected marine and estuarine species of commercial, recreational, ecological and/or conservation interest. Distribution polygons were created based on survey information, digital data, and expert opinion provided primarily by local resource experts at Massachusetts of Division of Marine Fisheries (MDMF), Massachusetts Division of Fisheries and Wildlife (MADFW), Northeast Fisheries Science Center (NEFSC), and Rhode Island Division of Fish and Wildlife (RI DFW). National Hydrography Dataset (NHD) stream line data was buffered into polygons and integrated with the ESI hydrographic layer where additional coverage was necessary to accurately portray species extent inland.
- 2016-01-01 00:00:00 - Step 2. Estuarine and marine invertebrates of Rhode Island. Distribution, abundance, and seasonality of estuarine and marine invertebrate species in Rhode Island was primarily based on expert input and review from RI DFW Marine Fisheries. General distribution polygons were developed using a draft document summarizing the presence or absence of common shellfish species in vulnerable coastal waters and supported by invertebrate data collected between 1979 and 2015 during three fishery independent surveys conducted by RI DFW Marine Fisheries: Coastal Fishery Resource Assessment Trawl Survey, Narragansett Bay Juvenile Finfish Beach Seine Survey, and Coastal Pond Juvenile Finfish Beach Seine Survey. Data from the URI GSO Fish Trawl Survey was also used to support invertebrate presence in Narragansett Bay. The majority of species were mapped by RI DFW invertebrate specialists to one of the following three spatial coverages: 1) Little Narragansett Bay, Narrow River, coastal ponds including Great Salt Pond (Block Island), and tidal waters in Narragansett Bay north of the COLREGS line; 2) all of the aforementioned areas in addition to a one nautical mile extension seaward from the coastal feature; or 3) all coastal waters. Known spawning sites for horseshoe crab were mapped in Narragansett Bay and along the southern shore. Two invertebrate species of high importance in Rhode Island coastal waters are the longfin squid and American lobster, the latter of which is overfished and considered in depleted, poor condition (RI DFW).
- 2016-01-01 00:00:00 - Step 3. Estuarine and marine invertebrates of Massachusetts. Distribution, abundance, and seasonality of estuarine and marine invertebrate species in Massachusetts waters varies greatly north and south of Cape Cod, a peninsula that is considered the shoreward boundary of the Gulf of Maine and Virginian Province coastal ecosystems. Inshore coverages were created primarily using expert input and data from MDMF that includes the Resource Assessment Project Bottom Trawl and Seine Surveys and Lobster Ventless Trap Survey. The latter dataset is a random stratified fishery-independent survey that has been conducted since 2006 and hauls traps twice per month, June through September. Offshore coverages were developed using data and expert input from NEFSC that includes distribution maps indicating location and abundance (raw catch numbers) of select marine invertebrates collected during spring and fall bottom trawl surveys from 2006 through 2016. The boundary between state and federal waters in

Massachusetts is clearly defined in the atlas. Six invertebrate species identified as Important Fish Resources by the 2015 Massachusetts Ocean Management Plan were mapped using a subset of the MDMF Trawl Survey data. Concentration areas for the migratory longfin squid, present in high numbers throughout all coastal waters April through November, were calculated using relative abundance of counts from 2000 through 2015 and assigned a value of “Common”. Kernel density maps were created for channeled and knobbed whelk, horseshoe crab, Jonah crab, and sea scallop using spring and fall biomass from 1978 through 2012. Kernel density analysis conceptually fits a smoothly curved surface over each point. The surface value is highest at the location of the point and diminishes with increasing distance from the point, reaching zero at the search radius distance from the point. The neighborhood size was selected by conducting an iterative assessment to determine the peak z-score. The Kernel density analysis tool in ArcGIS 10.2 Spatial Analyst was used with a 5 km circular neighborhood with a fixed distance band. Biomass was used as the population field value for each point. North and south were analyzed separately and combined in the final map. Density analysis was selected instead of interpolation since it is designed to show where point features are concentrated and can be weighted by population fields. Density surfaces are not designed to predict values at unsampled locations. The resulting polygons of graded density were mapped as “Concentration Areas” and assigned values ranging from “High” to “Low”. The seasonality of these areas generally reflects the species abundance and breeding activity captured by the fall and spring trawl survey months, though it should be noted that there is a year-round presence in these areas as well. All six of the aforementioned species were mapped as general distribution polygons outside of these concentration areas except for channeled and knobbed whelk. Whelks are present, however, in all state waters south of Cape Cod with the exception of deeper areas, and also have limited distribution north of the Cape.
- 2016-01-01 00:00:00 - Step 4. Horsehoe crab, blue crab, and American lobster in Massachusetts. Spawning sites on sandy beaches were mapped for horseshoe crabs, and nursery areas mapped in marsh habitat and protected embayments where juveniles can remain for the first few years of their lives. Nursery areas were also mapped for blue crabs, which have a highly estuarine dependent life history and distribution. As with a few other invertebrate species, such as northern shrimp, an offshore depth contour between 20’ and 40’ was used to define the extent of species distribution. Concentration areas for lobster were created using relative abundance of lobster catch per trap haul data from the Ventless Trap Survey between 2010 and 2015 (except for 2013), and assigned values of “High” or “ Medium”. Seasonality of these areas reflects the months of the survey season, but concentrations can persist year-round Data from earlier seasons was not included as the more recent years better represent current conditions regarding increasing water temperatures and resulting species distribution. Lobster populations as a whole are much larger north of Cape Cod; Boston Harbor and Salem Sound are major areas of both juvenile and adult lobster concentrations and should be considered critical lobster habitat. All lobster data and information was provided

by Tracy Pugh, MDMF.
- 2016-01-01 00:00:00 - Step 5. Special cases of estuarine and marine invertebrates. Nine species of shellfish were mapped in Massachusetts as general distribution polygons with a value of “Potential” using MDMF’s 2011 Shellfish Suitability Areas data layer. These polygons represent habitats suitable for shellfish species and include sites where shellfish have been observed since the mid-1970’s, but may not currently support any shellfish. MDMF approved use of these data for this atlas, but should be contacted directly for up-to-date information or site specific assessments for impact or mitigation. Mussel beds, as well as ampelisca (amphipods) and crepidula (commonly known as slipper shells) beds, were mapped as polygons in Narragansett Bay using data from NBEP and expert input from RI DEM. Additional estuarine and marine invertebrate species present in the AOI but not included in the atlas either due to limited commercial importance or paucity of data in AOI include the green urchin (Strongylocentrotus droebachiensis), green crab (Carcinus maenas), lady crab (Ovalipes ocellatus), and a few species of spider crab.
- 2016-01-01 00:00:00 - Step 6. Rare freshwater species and rare insects. General distribution polygons for rare freshwater bivalves in Massachusetts and Rhode Island were mapped as “Rare freshwater mussels” according to the geographic areas highlighted in species profiles of the 2015 RI WAP and 2015 MA SWAP. All species are either state species of concern of special conservation interest and include alewife floater (Anodonta implicate), eastern lampmussel (Lampsilis radiate), eastern pondmussel (Ligumia nasuta), squawfoot (Strophitus undulates), and tidewater mucket (Leptodea ochracea). The eastern pearlshell (state endangered) is mapped only in Rhode Island and can be found in the Pawcatuk River basin, which supports several species of freshwater mollusks (2015 RI WAP). MADFW NHESP provided data for “Rare snail” in Massachusetts; these gastropods inhibit fresh or brackish marshes and are mapped as “Vulnerable Occurrence”. Rare insects in Rhode Island were mapped as polygons clipped from marine waters and assigned the mapping qualifier of “Vulnerable Occurrence” using 2016 RI DEM Natural Heritage Areas data. Additional information for beetles was provided by Chris Raithel, RI DEM. The American burying beetle (state and federally endangered) is most commonly found in field habitats on Block Island only, and may be secondarily affected by an oil spill if the carrion it is attracted to has suffered trauma. The ringed boghaunter (state endangered) can be found in fens and bogs located in coastal plain peatlands and have a brief flight season extending only from late April to early June (2015 RI WAP). All other insect species included in the Natural Heritage data located in the Rhode Island AOI were assigned to one of two species groups in the atlas: “Threatened insect” or “Rare insect” (Species of Concern, or of special conservation interest).

5.1.1. If data at different stages of the workflow, or products derived from these data, are subject to a separate data management plan, provide reference to other plan:

5.2. Quality control procedures employed (describe or provide URL of description):

6. Data Documentation

The EDMC Data Documentation Procedural Directive requires that NOAA data be well documented, specifies the use of ISO 19115 and related standards for documentation of new data, and provides links to resources and tools for metadata creation and validation.

6.1. Does metadata comply with EDMC Data Documentation directive?

No

6.1.1. If metadata are non-existent or non-compliant, please explain:

Missing/invalid information:
- 1.7. Data collection method(s)
- 4.1. Have resources for management of these data been identified?
- 4.2. Approximate percentage of the budget for these data devoted to data management
- 5.2. Quality control procedures employed
- 7.1. Do these data comply with the Data Access directive?
- 7.1.1. If data are not available or has limitations, has a Waiver been filed?
- 7.1.2. If there are limitations to data access, describe how data are protected
- 7.2. Name of organization of facility providing data access
- 7.2.1. If data hosting service is needed, please indicate
- 7.4. Approximate delay between data collection and dissemination
- 8.1. Actual or planned long-term data archive location
- 8.3. Approximate delay between data collection and submission to an archive facility
- 8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?

6.2. Name of organization or facility providing metadata hosting:

NMFS Office of Science and Technology

6.2.1. If service is needed for metadata hosting, please indicate:

6.3. URL of metadata folder or data catalog, if known:

https://www.fisheries.noaa.gov/inport/item/51769

6.4. Process for producing and maintaining metadata

(describe or provide URL of description):

Metadata produced and maintained in accordance with the NOAA Data Documentation Procedural Directive: https://nosc.noaa.gov/EDMC/DAARWG/docs/EDMC_PD-Data_Documentation_v1.pdf

7. Data Access

NAO 212-15 states that access to environmental data may only be restricted when distribution is

explicitly limited by law, regulation, policy (such as those applicable to personally identifiable information or protected critical infrastructure information or proprietary trade information) or by security requirements. The EDMC Data Access Procedural Directive contains specific guidance, recommends the use of open-standard, interoperable, non-proprietary web services, provides information about resources and tools to enable data access, and includes a Waiver to be submitted to justify any approach other than full, unrestricted public access.

7.1. Do these data comply with the Data Access directive?

7.1.1. If the data are not to be made available to the public at all, or with limitations, has a Waiver (Appendix A of Data Access directive) been filed?

7.1.2. If there are limitations to public data access, describe how data are protected from unauthorized access or disclosure:

7.2. Name of organization of facility providing data access:

7.2.1. If data hosting service is needed, please indicate:

7.2.2. URL of data access service, if known:
https://response.restoration.noaa.gov/esi_download

7.3. Data access methods or services offered:
Data can be accessed by downloading the zipped ArcGIS geodatabase from the Download URL (see Distribution Information). Questions can be directed to the ESI Program Manager (Point Of Contact).

7.4. Approximate delay between data collection and dissemination:

7.4.1. If delay is longer than latency of automated processing, indicate under what authority data access is delayed:

8. Data Preservation and Protection

The NOAA Procedure for Scientific Records Appraisal and Archive Approval describes how to identify, appraise and decide what scientific records are to be preserved in a NOAA archive.

8.1. Actual or planned long-term data archive location:
(Specify NCEI-MD, NCEI-CO, NCEI-NC, NCEI-MS, World Data Center (WDC) facility, Other, To Be Determined, Unable to Archive, or No Archiving Intended)

8.1.1. If World Data Center or Other, specify:

8.1.2. If To Be Determined, Unable to Archive or No Archiving Intended, explain:

8.2. Data storage facility prior to being sent to an archive facility (if any):
Office of Response and Restoration - Seattle, WA

8.3. Approximate delay between data collection and submission to an archive facility:

8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?
Discuss data back-up, disaster recovery/contingency planning, and off-site data storage relevant to the data collection

9. Additional Line Office or Staff Office Questions
Line and Staff Offices may extend this template by inserting additional questions in this section.